Small Business Innovation Research/Small Business Tech Transfer

Integration of 4D Airline Operation Control Systems into NextGen and the NAS, Phase I

Completed Technology Project (2016 - 2016)

Project Introduction

WxOps patent pending OpsTablet(TM) software and 4D geospatial data are used by Hawaiian Airlines to achieve unprecedented Airline Operation Control (AOC) in a geobrowser-based Common Operating Environment (COE). Dispatchers and pilots coordinate flight operations in real time using identical Google Earth based visualizations on desktops and tablets both on the ground and in the cockpit during flight. Google has unilaterally deprecated critical functionality which causes the latest versions of the Google Earth application to be unsuitable for FAA regulated flight operations. Additional unilateral changes to Google licensing terms are impacting applications for international transportation, particularly for flight operations in Asia. WxOps has anticipated the need for an alternate geobrowser, and has tested NASA World Wind open source components for critical functionality needed at Hawaiian. NASA World Wind provides the equivalent or superior performance for critical functions when compared to Google Earth. WxOps proposes to enhance and harden NASA World Wind open source to achieve and potentially exceed the equivalent of Google Earth best practices. This includes the introduction of a COM API software interface for coupling of NASA World Wind with WxOps OpsTablet(TM) and other flight operations software. A successful outcome will provide a reliable geobrowser capability which can serve transportation community applications in the years to come without fear of deprecation by an uninterested commercial interest. WxOps proposes to: A. Evaluate NASA World Wind Open Source for geobrowser equivalent of current geobrowser (Google Earth). B. Prototype a World Wind based Application that demonstrates critical and required Common Operating Environment (COE) functionality. C. Build a support community including Commercial Airlines Associations for continued support. D. Share the COE Application with the support community.

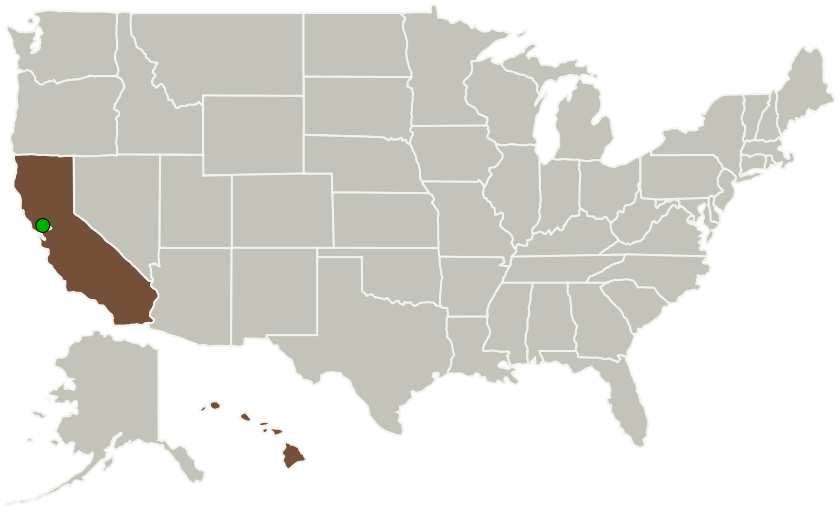
Integration of 4D Airline Operation Control Systems into NextGen and the NAS, Phase I

Table of Contents

Integration of 4D Airline Operation Control Systems into NextGen and the NAS, Phase I

Completed Technology Project (2016 - 2016)

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
WxOps, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB), Veteran-Owned Small Business (VOSB)	Honolulu, Hawaii
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Hawaii

Project Transitions

June 2016: Project Start

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

WxOps, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

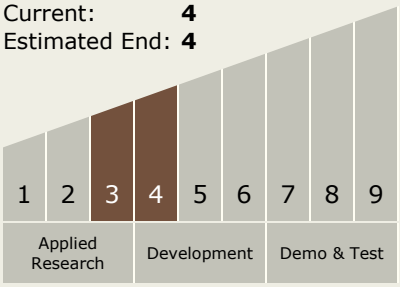
Carlos Torrez

Principal Investigator:

Scott Shipley

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Integration of 4D Airline Operation Control Systems into NextGen and the NAS, Phase I

Completed Technology Project (2016 - 2016)

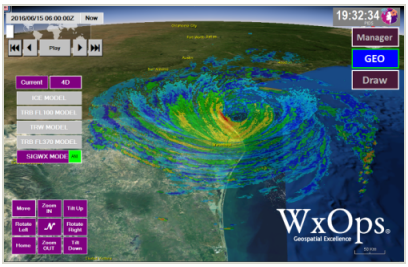
December 2016: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139660)*

Images

Briefing Chart Image
Integration of 4D Airline Operation Control Systems into NextGen and the NAS, Phase I *(https://techport.nasa.gov/image/134321)*



Final Summary Chart Image
Integration of 4D Airline Operation Control Systems into NextGen and the NAS, Phase I Project Image *(https://techport.nasa.gov/image/136770)*

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
  - TX15.1 Aerosciences
    - TX15.1.8 Ground and Flight Test Technologies

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System